# Toll Rate Setting

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**Washington State Transportation Commission**
**January 20, 2010**

Washington State Department of Transportation

# Today’s Presentation

## Morning Session:

- SR 520 Rate-Setting Schedule
- SR 520 Policy Issues and Orange County Information

## Afternoon Session:

- TNB Rate Discussion
- TNB Violation Processing Report
- Toll Study Reports

# Approach to Toll Rate Setting For SR 520

Presented by:

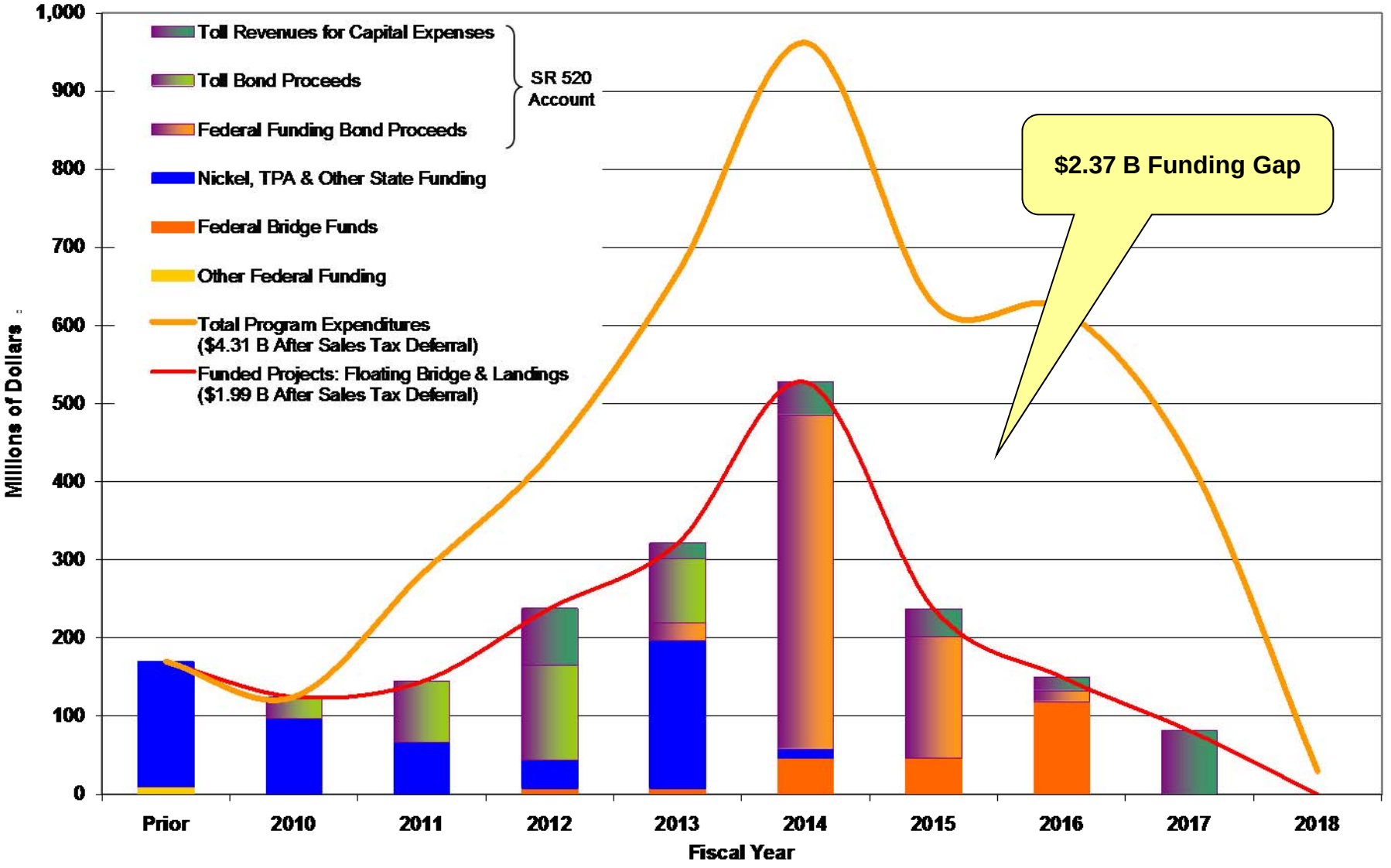
**Craig Stone**, WSDOT Toll Division Director

# Statutory Requirements Regarding Tolling SR 520

- The total cost of projects in the SR 520 corridor program will be no more than $4.65 billion.
- The Commission must set a variable schedule of toll rates to:
  - Maintain sufficient travel time, speed and reliability in the corridor; and
  - Generate sufficient revenue to pay the bond and interest payments for the project.
- Toll rates may be adjusted at least annually to reflect inflation.
- Toll funding must only be used to fund operations, maintenance, and construction of replacement of the floating bridge and necessary landings.

*The Commission should keep in mind that a future finance plan will need to include funds for the remaining components of the full $4.65 billion project.*

# $4.65 B Program Funding Gap



# Knowns and Unknowns Shaping the Discussion

## SR 520 Legislative Workgroup recommendations

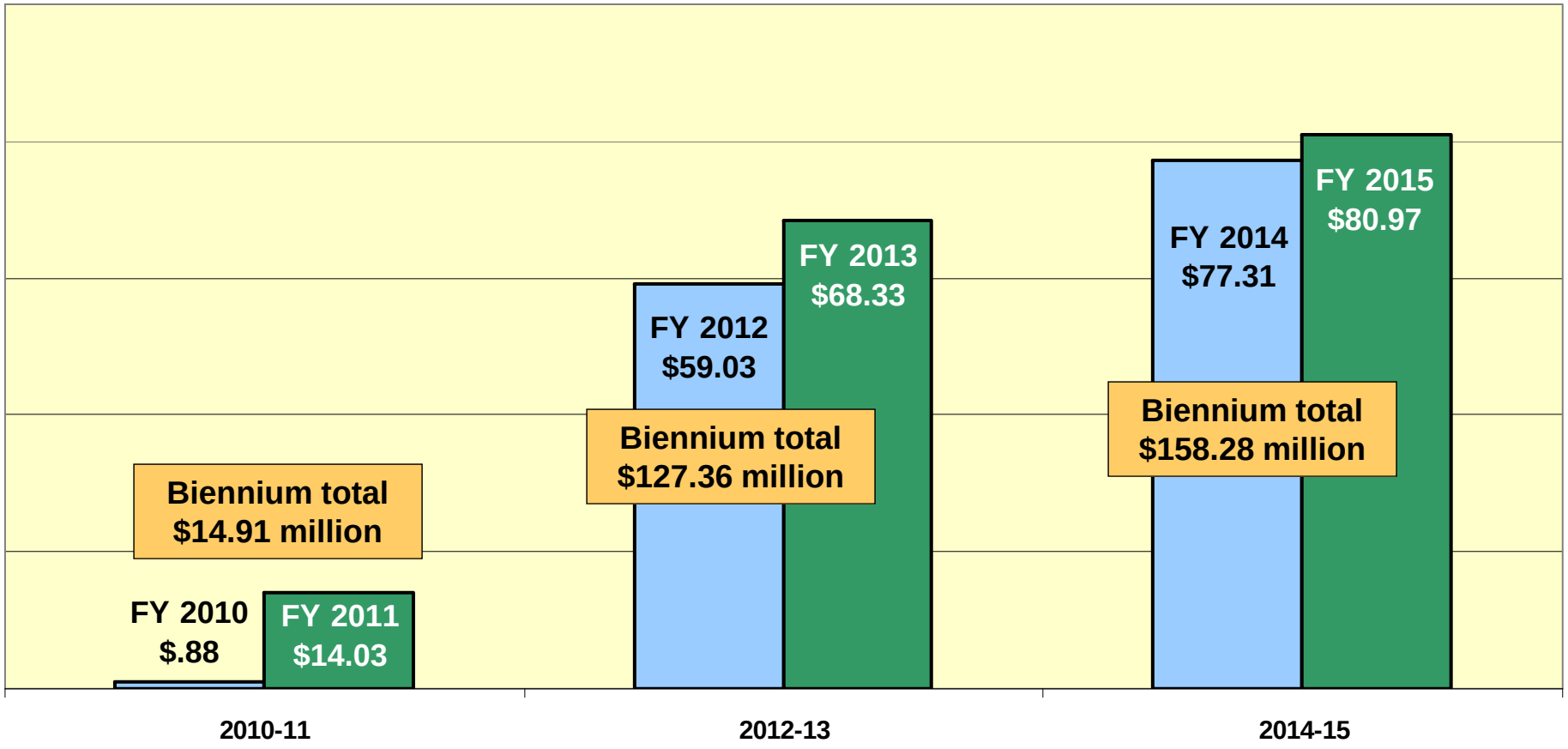
- The legislative workgroup recommended the use of previously authorized funding included in early tolling of SR 520 per Scenario 7 of the Tolling Implementation Committee work conducted in 2008.

## Factors that influence toll-setting that are unknown at this time

- Timing for funding the Eastside of the project
- The final interchange configuration for the Westside of the project
- The ultimate components of a finance plan that funds a full $4.65 billion project

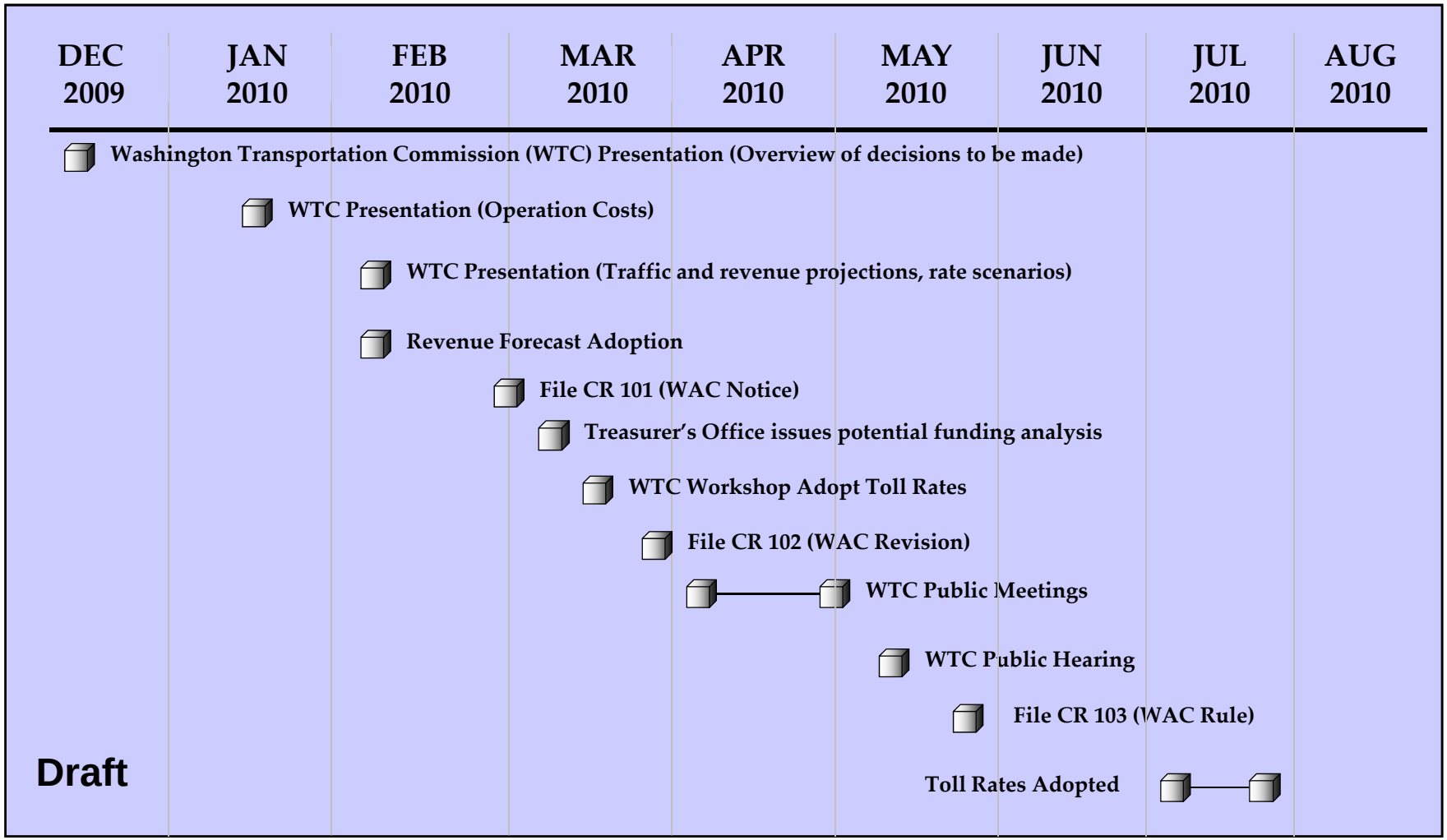
# SR 520 Gross Toll Revenue Targets FY 2010-15

*Scenario 7 Tolls — Modeled for tolling beginning March 19, 2011*




**$ millions**

# Proposed Toll Rate Timeline 2009-10




Notes:

Public Meetings on 520 Toll Rates to be held in Seattle and in Eastside communities (i.e. Bellevue, Kirkland)

# Next Steps

# Initial Scenarios

**Tolling Implementation Committee***

- Scenario 7 – as recommended by SR 520 work group.
- Toll rates for 2011 are set at a maximum of $3.25.
- Higher toll rates in 2016, post construction.

**Revenue maximization***

- Toll rates adjust to generate highest possible revenue, with reasonable toll rates.

**Free Flow**

- Toll rates and schedule adjusted to achieve average speeds at 45 mph or higher 90 percent of the time during peak hours.

**Low toll rates**

- Adjust toll rates to minimize diversion.


**** Traffic results available at February Commission Meeting, revenue results available in March***

# Who Uses the 520 bridge?

## 2009 Origin and Destination Survey

### Trip Purpose by Time of Day

| | Trip Purpose | AM Peak (6-9 AM) | Midday (9 AM-3 PM) | PM Peak (3-6 PM) | Evening (6-10 PM) | Overnight (10 PM-6 AM) | All Time Periods |
|---|---|---|---|---|---|---|---|
| 1. | Going To Work | 85.0% | 19.3% | 4.7% | 4.6% | 24.2% | 25.9% |
| 2. | Returning from work | 1.4% | 6.3% | 62.4% | 46.3% | 17.2% | 24.0% |
| 3. | Company business | 5.3% | 25.2% | 6.4% | 3.3% | 2.3% | 11.9% |
| 4. | Vacation/Recreational | 1.4% | 4.3% | 2.9% | 7.9% | 12.5% | 5.1% |
| 5. | Shopping | 0.6% | 8.3% | 1.8% | 3.3% | 3.1% | 4.3% |
| 6. | School | 2.0% | 2.8% | 3.9% | 2.8% | 0.0% | 2.5% |
| 7. | Social Friends | 1.0% | 13.0% | 9.5% | 24.7% | 32.0% | 14.5% |
| 8. | Medical/Personal | 3.2% | 20.4% | 8.0% | 6.6% | 8.6% | 11.4% |
| - | no response | 0.1% | 0.3% | 0.2% | 0.4% | 0.0% | 0.2% |
| - | **Total** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** |

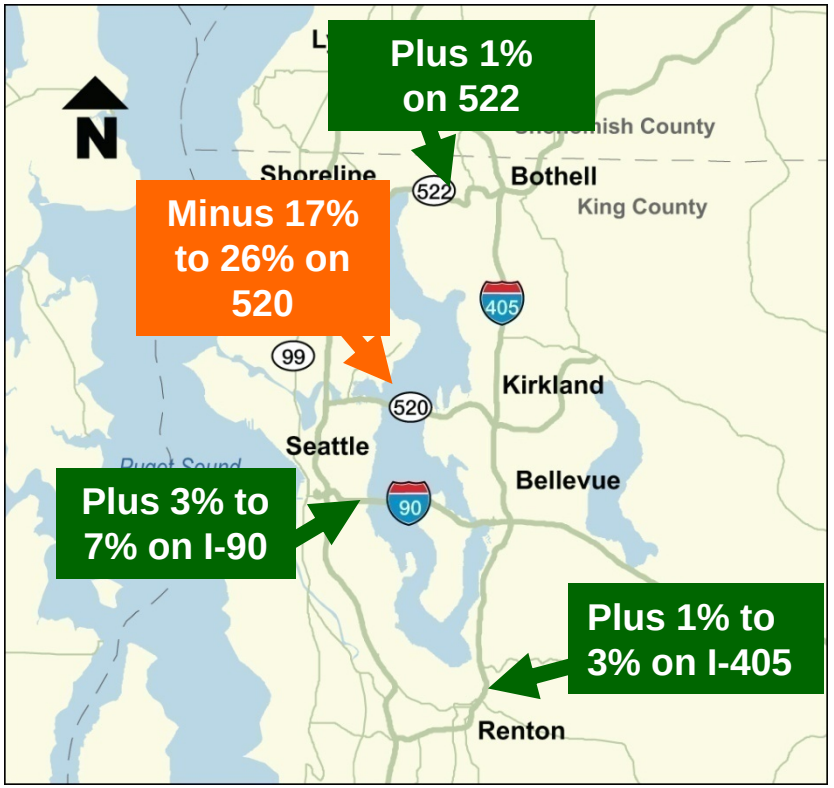
# An Example of Route Diversion

**People may change their travel routes,
but net effect is distributed across the system**

- Peak period traffic on I-90 increases less than 5%, except in highest toll one-bridge scenario (8%).
- Peak period traffic on SR 522 (at 61st/Kenmore) increases no more than 5%.
- Peak period traffic on I-405 (at SR 167) increases no more than 3%.
- Local roadways leading to tolled bridges have less traffic when tolls are in place.
- System-wide congestion makes alternative routes less attractive.

**Examples of traffic diversion when tolling 520**

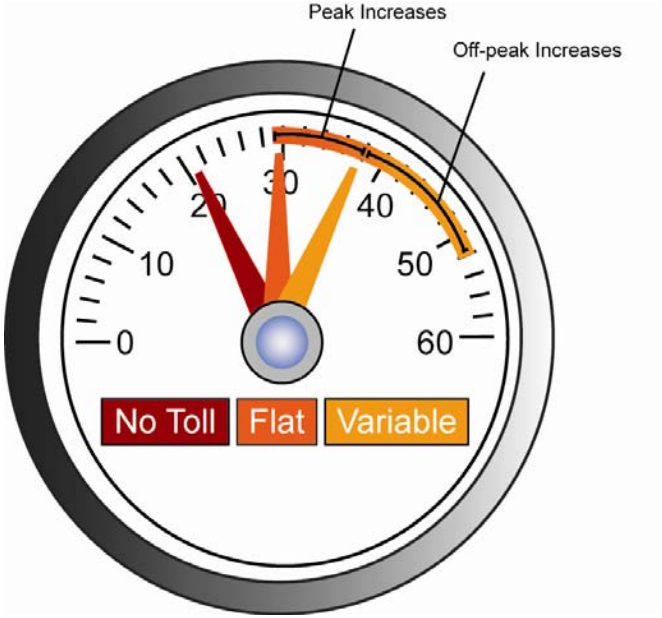
*(2010, Scenario 7: Toll 520 in 2010, increase rate in 2016)*



# An Example of How Tolling Improves Traffic Flow on the 520 Bridge

**On average, variable tolling leads to higher speeds from I-5 to I-405:**

- Speeds increase on average from 10 – 30 mph.
- By charging higher tolls during the busiest times, travel speeds increase about 13 to 16 mph through 2010 without tolls.
- Off peak speeds increase between 13 and 19 mph.
- With flat rate tolls, SR 520 speeds improve 7 mph in the peak and 16 mph in the off-peak.

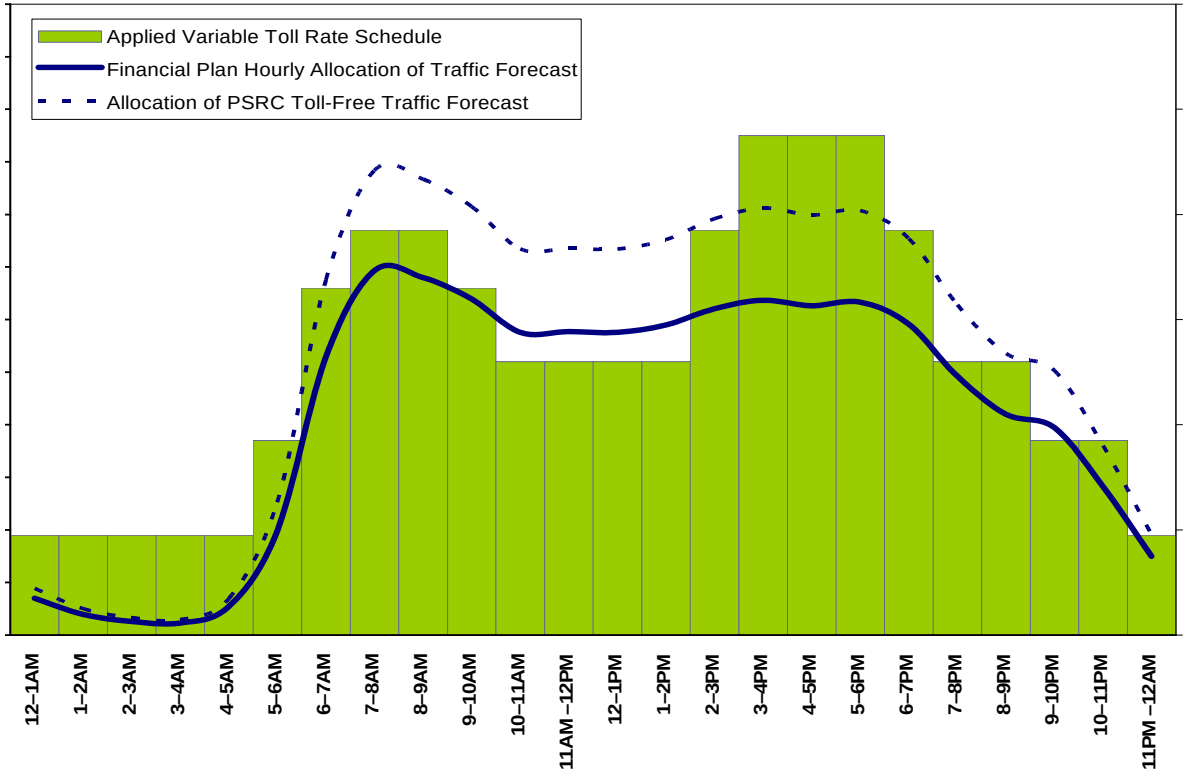



***520 bridge speed ranges, comparing no toll, flat toll and variable tolls in peak times in 2010. Off-peak speed increases could be up to 30 mph.***

# Issues For Today's Discussion

# Issues To Consider

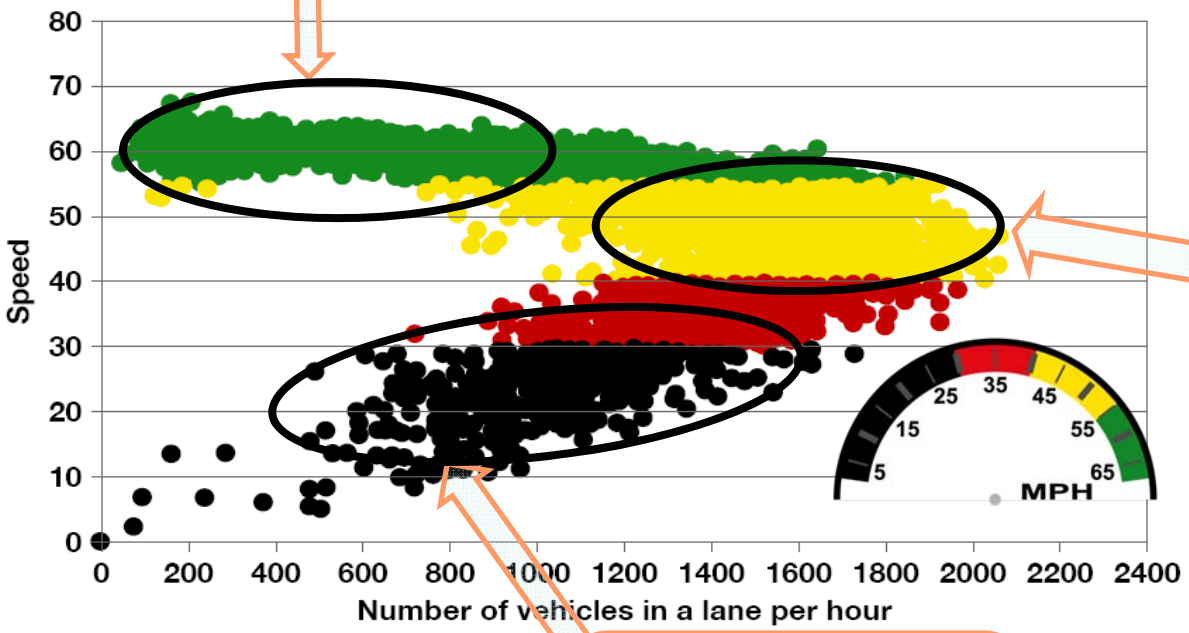
- **SR 520 toll rate setting will be more complex than Tacoma Narrows Bridge or SR 167 HOT lanes**
- Need to consider both revenue and congestion management goals
- All-electronic tolling will require different approach for tolling infrequent customers
- Urban Partnership Agreement objectives need to be accommodated



# Maximizing throughput

*The most effective price to move the most traffic*

If the price is too high, the lanes will be empty

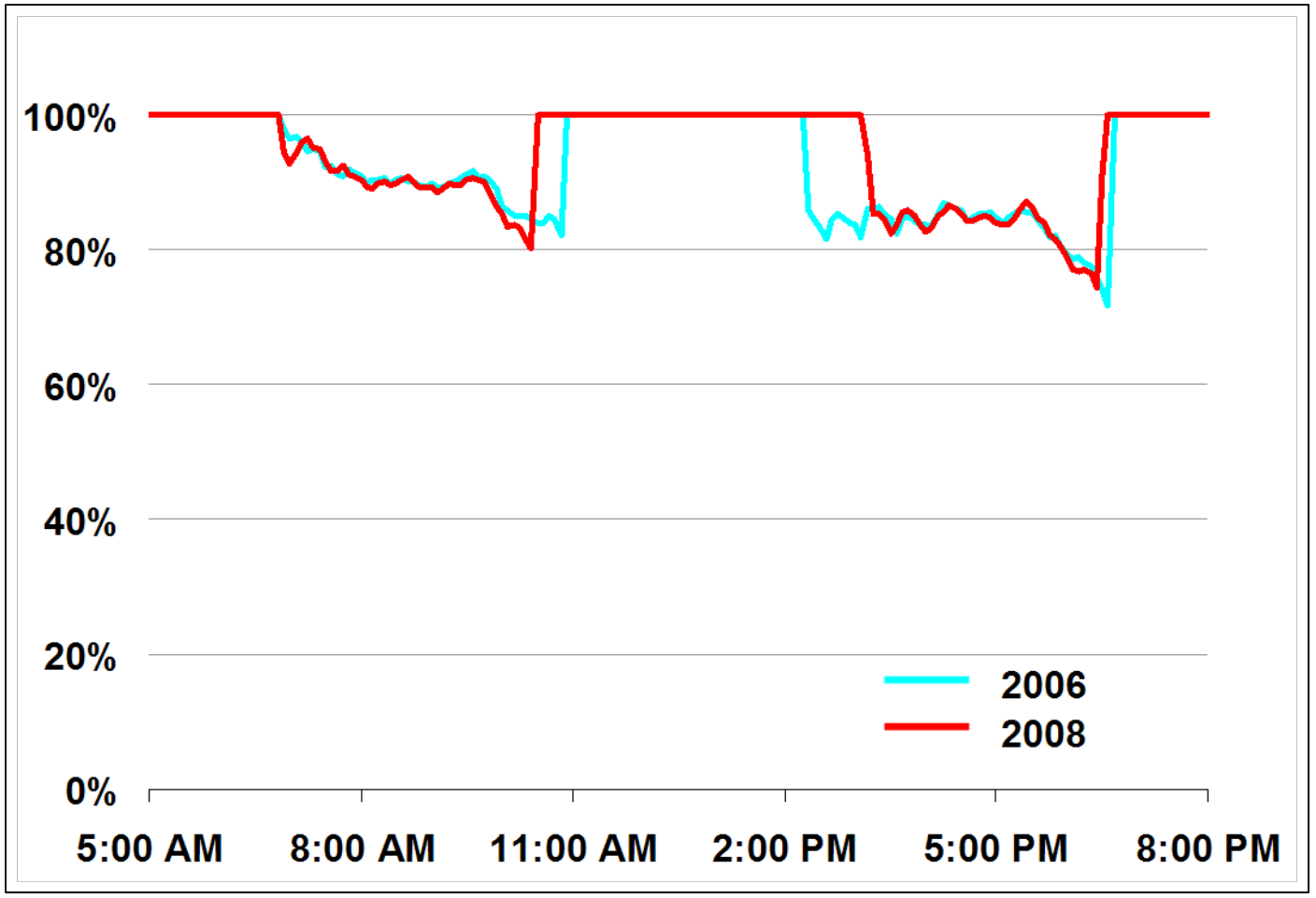



Priced to obtain free flow conditions.

If the price is too low, the lanes will be congested and slow moving

# Lost Throughput Productivity

**SR 520 at Evergreen Point Floating Bridge (MP 1.5)**




*Based on AM westbound 1740 vphpl and PM eastbound 1760 vphpl*

# Additional Issues To Consider

**Consistency**

- What toll practices must be consistent from one corridor to the next?

**Base Rates and Financial Policies**

- What financial policies are needed?
- How will early tolling rates compare to future rates?
- Will truck rates be set using the same approach as TNB?

**Discounts and Exemptions**

- What (if any) discounts or exemptions should be provided to transit, vanpools, carpools, low-emission vehicles, etc?
- Should discounts vary on different tolled facilities?

# Issues To Consider Regarding Complexity and Fees

**Rate structure/complexity**

- How much complexity is needed to manage traffic effectively?
- How important is simplicity to the customer?
- How will rate structure be displayed/signed to the motorist in real time?

**Account incentives or fees**

- What are objectives for varying price by account/payment type?
- Better to set tolls with incentives, or charge fees for higher cost collection?

# Issues To Consider Regarding Rate Setting Process

**What elements of rate-setting will be specified by the Commission?**

- Full rate and fee schedule?
- Principles for adjusting by time period administered by WSDOT?

**How should rates be adjusted?**

- Should some adjustments be made by WSDOT, and under what circumstances?
- Should the Commission provide for an abbreviated process to respond to traffic conditions?

**How will Commission solicit public input?**

- Input limited to tolls, or full corridor management?
- Consistent process for all corridors?

# Timeline For Discussion

**Tight schedule for rate setting**

- Must recommend toll rates by March to sell bonds in July.
- Adopt toll rates by rule by July.
- This is half the time used to set initial toll rates for TNB.

**Will require significant time investment**

- Allocate at least a half-day for discussion at Jan, Feb, March meetings.
- Workshops with Tolling Subcommittee leading into meetings.

# Proposed Commission Meetings

**Subcommittee Meeting 1**
- Early January
- Focus on 520 rate setting issues

**Subcommittee Meeting 2**
- Mid January
- Focus on TNB rate setting

**January Commission Meeting**
- Discuss 520 issues
- Propose TNB toll rates

**Subcommittee Meeting 3**
- Early February
- Discuss consistency, multi-axle vehicles, exemptions

*Refer to handout for details on meeting topics and goals.*

**Subcommittee Meeting 4**
- Mid February
- Scenarios, models, policies

**February Commission Meeting**
- Discuss 520 traffic and congestion issues

**Subcommittee Meeting 5**
- Early March
- Review financial plans

**Subcommittee Meeting 6**
- Mid March
- Discuss rate proposals

**March Commission Meeting**
- Propose initial rates for SR 520 tolling

# Toll Rate Setting in Orange County, California

Presented by:

**Craig Stone**, WSDOT Toll Division Director

# A Toll Rate Setting Example From Orange County, California

- OCTA is the Orange County, California MPO, Transit Operator and owner of the 91 Express Lanes.
- The OCTA Board is made up of local elected officials.
- OCTA bought the 91 Express Lanes in 2002 from California Private Transportation Company, the original private developer, owner and operator.
- OCTA refinanced the (private) debt and inherited the toll schedule in place at transfer of ownership.
- In 2003, OCTA adopted a policy for toll rate changes that does not require board approval of the specific adjustments.
- There is an advisory committee comprised of Board members that meets quarterly; however, they are not required to approve any toll adjustments prior the adjustment.
- The toll policy requires the Board and customers to be informed about any toll adjustments ten days prior to the change.

# Goals Were Set By The OCTA Board

**The toll adjustment goals are to:**

- reduce the likelihood of congestion by diverting traffic to other hours with available capacity;
- maintain free flow travel speed in the 91 Express Lanes;
- maintain travel time savings;
- accommodate projected growth in travel demand, and;
- ensure that the toll road generates sufficient revenue to effectively operate the toll lanes and maintain a strong debt service position.

# Parameters For Adjusting Toll Rates in Orange County

**Super Peak hours are determined as follows:**

- Traffic volumes are monitored on a rolling 12 consecutive week basis.
- Hourly, daily, and directional traffic volumes of 3,128 or more are flagged for further review.
- If traffic volume is consistently at a level of “Super Peak” then the toll rate for that hour, day and direction may be increased.
- The toll for that hour, day, and direction can be adjusted, as follows:
  - if the average vehicle volume is 3,300 or more, the toll is increased by $1.00.
  - if the average vehicle volume is between 3,200 and 3,299, the toll is increased by $0.75.
  - if the average vehicle volume is less than 3,200, the toll is not changed.
  - if volume is below 2720, toll rate is decreased by $0.50.

*Customers are informed of a toll adjustment 10 or more days prior to that toll adjustment becoming effective. Toll rate remains in effect for six months*.

# Toll Schedule in Orange County

91 Express Lanes **Toll Schedule** — Effective October 1, 2009 — **Eastbound** SR-55 to Riverside Co. Line

| | Sun | M | Tu | W | Th | F | Sat |
|---|---|---|---|---|---|---|---|
| Midnight | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 1:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 2:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 3:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 4:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 5:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 6:00 am | $1.30 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $1.30 |
| 7:00 am | $1.30 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $1.30 |
| 8:00 am | $1.65 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 |
| 9:00 am | $1.65 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 |
| 10:00 am | $2.50 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.50 |
| 11:00 am | $2.50 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.50 |
| Noon | $3.00 | $2.05 | $2.05 | $2.05 | $2.05 | $3.10 | $3.00 |
| 1:00 pm | $3.00 | $2.85 | $2.85 | $2.85 | $3.10 | $4.85 | $3.00 |
| 2:00 pm | $3.00 | $4.05 | $4.05 | $4.05 | $4.15 | $4.10 | $3.00 |
| 3:00 pm | $2.50 | $4.35 | $3.70 | $5.45 | $5.90 | $9.50 | $3.00 |
| 4:00 pm | $2.50 | $5.55 | $7.75 | $8.25 | $9.90 | $9.30 | $3.00 |
| 5:00 pm | $2.50 | $5.35 | $7.25 | $7.75 | $9.05 | $7.25 | $3.00 |
| 6:00 pm | $2.50 | $4.35 | $4.10 | $3.60 | $4.90 | $5.25 | $2.50 |
| 7:00 pm | $2.50 | $3.10 | $3.10 | $3.10 | $4.45 | $4.90 | $2.05 |
| 8:00 pm | $2.50 | $2.05 | $2.05 | $2.05 | $2.85 | $4.45 | $2.05 |
| 9:00 pm | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.85 | $2.05 |
| 10:00 pm | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $2.05 | $1.30 |
| 11:00 pm | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |

91 Express Lanes **Toll Schedule** — Effective October 1, 2009 — **Westbound** Riverside Co. Line to SR-55

| | Sun | M | Tu | W | Th | F | Sat |
|---|---|---|---|---|---|---|---|
| Midnight | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 1:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 2:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 3:00 am | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 4:00 am | $1.30 | $2.40 | $2.40 | $2.40 | $2.40 | $2.40 | $1.30 |
| 5:00 am | $1.30 | $3.95 | $3.95 | $3.95 | $3.95 | $3.80 | $1.30 |
| 6:00 am | $1.30 | $4.05 | $4.05 | $4.05 | $4.05 | $3.95 | $1.30 |
| 7:00 am | $1.30 | $4.50 | $4.50 | $4.50 | $4.50 | $4.35 | $1.75 |
| 8:00 am | $1.75 | $4.05 | $4.05 | $4.05 | $4.05 | $3.95 | $2.05 |
| 9:00 am | $1.75 | $3.25 | $3.25 | $3.25 | $3.25 | $3.25 | $2.50 |
| 10:00 am | $2.50 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.50 |
| 11:00 am | $2.50 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.90 |
| Noon | $2.50 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.90 |
| 1:00 pm | $2.90 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.90 |
| 2:00 pm | $2.90 | $2.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.90 |
| 3:00 pm | $2.90 | $2.05 | $2.05 | $2.05 | $2.05 | $2.50 | $2.90 |
| 4:00 pm | $3.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.50 | $3.05 |
| 5:00 pm | $3.05 | $2.05 | $2.05 | $2.05 | $2.05 | $2.50 | $3.05 |
| 6:00 pm | $3.05 | $2.05 | $2.05 | $2.05 | $2.05 | $3.00 | $2.50 |
| 7:00 pm | $2.50 | $1.30 | $1.30 | $1.30 | $1.30 | $2.05 | $2.05 |
| 8:00 pm | $2.50 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 9:00 pm | $2.50 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 10:00 pm | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |
| 11:00 pm | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 | $1.30 |

**Holiday toll schedules for:**

New Years

Easter

Mother's Day

Memorial Day

Fourth of July

Thurs before Labor Day

Fri before Labor Day

Labor Day

Wed before Thanksgiving

Thanksgiving

Fri after Thanksgiving

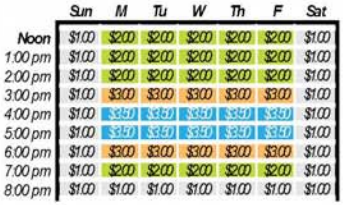
Christmas Day

# Today’s Decisions

Presented by:

**Craig Stone**, WSDOT Toll Division Director

# Examples of Different Toll Rate Structures

| | Flat Rate<br>*Single rate at all times* | Variable Peak<br>*Simple peak and off-peak rates* | Variable Stair-Step<br>*More complex; Same rate each day* | Variable Matrix<br>*Rates set for each hour/day/direction* | Dynamic<br>*Rate set based on traffic conditions* |
|---|---|---|---|---|---|
| **How rates could be communicated**<br>**Toll Concept** | The toll is $2.00<br>($1/axle for trucks) | RATES:<br>Time Period — Cars — Trucks<br>**Peak Periods** $3.50 $1.75/axle<br>*7 - 9 a.m. and 3 - 6 p.m. weekdays*<br>**Middays** $2.00 $1.00/axle<br>*5–7 a.m., 9 a.m. – 3 p.m., and 6–8 p.m.*<br>**Nights/Weekends** FREE |  |  | Toll rates are adjusted every six minutes based on traffic conditions. |
| **How rates could be communicated**<br>**Signs** | Toll Bridge<br>Passenger Cars $2.00<br>Trucks $1.00 per axle | Toll Bridge<br>Passenger Cars<br>Peak rate $3.50<br>Off-peak rate $2.00<br>Nights (8PM - 5AM) and Weekends Free<br>Peak hours 7-9 AM 3-6 PM M-F | Toll Bridge<br>Passenger Cars $1.00<br>Trucks $0.50 per axle | Toll Bridge<br>Passenger Cars $1.00<br>Trucks $0.50 per axle | Toll Bridge<br>Passenger Cars $1.00<br>Trucks $0.50 per axle |
| **Advantages** | ▪ Easiest to remember<br>▪ Easiest to understand and communicate | ▪ Fairly easy to understand and remember<br>▪ Has some positive influence on reducing traffic congestion<br>▪ Raises more revenue than a flat rate, or allows lower off-peak rates | ▪ Likely more efficient at reducing traffic congestion than peak/off-peak rates<br>▪ Likely to raise greater revenue than peak/off-peak rates<br>▪ Consistent with Toll Implementation Committee "scenario 7"<br>▪ May have more gradual rate changes between time periods. | ▪ May achieve greater congestion reduction benefit and/or higher throughput<br>▪ May achieve greater revenue<br>▪ May have more gradual rate changes between time periods. | ▪ This is the best approach for HOT lanes, where drivers have a choice whether to enter or not<br>▪ Most adaptive to variations in traffic to match demand to available capacity |
| **Challenges / Drawbacks** | ▪ Has least effect on reducing congestion<br>▪ Raises less revenue than variable rates<br>▪ Does not fulfill Urban Partnership Agreement commitment for variable tolls | ▪ Less than optimal congestion reduction<br>▪ Less than optimal revenue generation<br>▪ Steep change in rates at end of peaks causes drivers to wait along freeway for change to lower rates | ▪ Difficult for public to remember rates<br>▪ Customer will need to check their bill to verify what they paid | ▪ Difficult for public to remember rates<br>▪ May be difficult to arrive at the toll point precisely when desired<br>▪ Customer will need to check their bill to verify what they paid | ▪ Customers will not know rate until they are enroute; cannot change time of travel<br>▪ May cause real-time diversion and traffic impacts to alternative routes<br>▪ Significant financing risk without operating experience |
| **Initial Rate-setting Considerations** | ▪ Requires traditional traffic and revenue study | ▪ Requires more sophisticated traffic and revenue study | ▪ Requires unusually sophisticated traffic and revenue study, modeling multiple time periods<br>▪ Demand model has limited value for modeling time shifts; some adjustment to rate will likely be needed based on experience | ▪ Developing a detailed rate schedule exceeds the accuracy of predictive modeling<br>▪ A detailed schedule would likely need to evolve by starting tolling operations with a simpler rate schedule and making adjustments based on actual operating experience | ▪ Not applicable; rate-setting would endorse an algorithm and set maximum and minimum rates by policy |

# Examples of Different Toll Rate-Setting Processes

| | Commission Sets All Rates | Commission Sets Initial Rates and Adopts Rate Adjustment Process | Commission Sets Initial Rates, Sets Parameters for Adjustment |
|---|---|---|---|
| **Process** | Initial Rates (Commission): Propose Rates → Public Input → WAC → to set rates<br>Rate Adjustments (Commission): Propose Rates → Public Input → WAC | Initial Rates (Commission): Propose Rates → Public Input → WAC → to set rates and process to adjust<br>Rate Adjustments (Commission): Adjust Rates, Adjust Rates | Initial Rates (Commission): Propose Rates → Public Input → WAC → to set rates and process to adjust<br>Rate Adjustments (WSDOT): Adjust Rates, Adjust Rates |
| **How it could work** | ▪ A full rate-setting process is required for any rate adjustment<br>▪ Transportation Commission conducts all public outreach<br>▪ WAC addresses rate schedule only | ▪ Initial rate-setting WAC provides an abbreviated process for Commission approval of updated toll rates.<br>▪ WSDOT would provide recommended adjustments for Commission action.<br>▪ Public input at Commission meeting. | ▪ The Commission would adopt an initial rate schedule.<br>▪ Commission would adopt parameters within which WSDOT adjust rates to manage traffic. |
| **Advantages** | ▪ Consistent with current practice | ▪ Allows more flexibility to adjust rates as needed based on traffic<br>▪ Rates could be adjusted quarterly, or more frequently if needed | ▪ Allows the greatest flexibility to set rates that respond to traffic conditions.<br>▪ Allows for most complex rate structure<br>▪ Rates could be changed frequently |
| **Challenges / Drawbacks** | ▪ Very lengthy process to make changes needed to respond to traffic conditions<br>▪ Most likely requires a relatively simple rate structure<br>▪ Annual or semi-annual changes at most | ▪ Extra outreach may be required to obtain public input. | ▪ Some may feel this process does not provide adequate opportunity for public input |
| **Implementation Considerations** | ▪ Rate-setting to balance revenue and traffic needs will require the Commission to become experts on traffic operations, and understand full range of traffic management tools | ▪ Rate-setting to balance revenue and traffic needs will require the Commission to become experts on traffic operations, and understand full range of traffic management tools<br>▪ Rule-making will need to address parameters for adjustment process. | ▪ Commission will want to identify parameters within which toll rate adjustments will be acceptable.<br>▪ Rate adjustments would be a technical process based on traffic data. |

# Questions?

For more information on SR 520 Toll Rate Setting, please contact:

**Jennifer Ziegler**
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at

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Washington State Department of Transportation